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STUDIES OF THE OVA AND FIRST INSTAR

LARVAE OF GEOMETRIDAE
(ENNOMINAE). I.

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ABSTRACT

Four species of the subfamily ENNOMINAE (*Pero marmoratus* Grossbeck, *Syssaura puber* Grote & Robinson, *Apicia confusaria* (Hubner) and *Tetracis crocallata* Guenee) are studied, and illustrations of setal maps, anal plates and head cases, and photographs of ova, are presented.

INTRODUCTION

THIS IS THE FIRST in a series of studies of the ova and first instar larvae of GEOMETRIDAE. It is hoped that these studies will provide further understanding of species, genus and sub-family relationships existing in the GEOMETRIDAE.

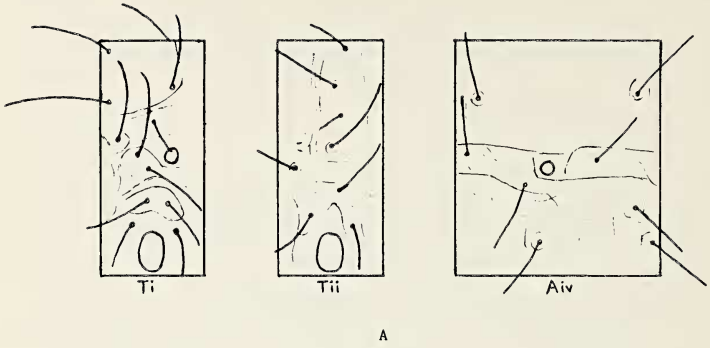
MATERIALS AND METHODS

Ova were secured by placing females in small vials containing paper tissue. I have found that most geometridae lay quite readily under these conditions, usually the very night they are captured.

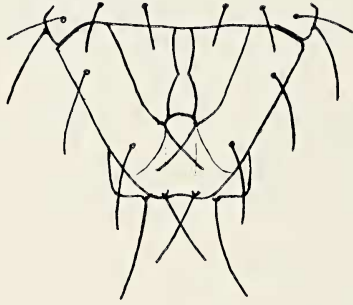
A WILD M-5 microscope with drawing tube attachment was used throughout the study. Photographs of ova were taken with phototube attachment and a Polaroid camera in conjunction with a double iris diaphragm for increased clarity.

The descriptions are based on ova and larvae from these female captures: *Pero marmoratus*, taken at Coolie Lake, Clay Co., Missouri, 3 May 1972; *Syssaura puber*, taken at Blue Springs State Park, Washington Co., Arkansas, 26 May 1972; *Apicia confusaria*, taken at Blue Springs State Park, Washington Co., Arkansas, 26 May 1972; *Tetracis crocallata*, taken at Warsaw, Benton Co., Missouri, 1 June 1972.

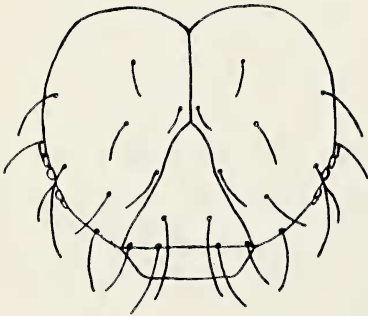
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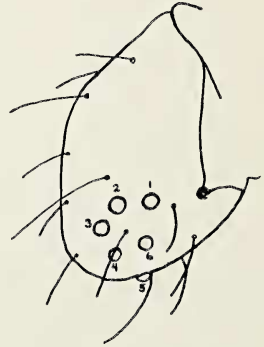
A



B



C



D

Fig. 1.—*Pero marmoratus* Grossbeck; (A) setal maps; (B) anal plate; (C,D) head, frontal and left lateral aspect, 80X.

RESULTS

Pero marmoratus Grossbeck

OVUM: Height: 0.82mm. Width: 0.65mm. Grass green with yellow areas. Laid singly and in groups on end or side. Eclosion in seven days.

FIRST INSTAR LARVAE: Length: approximately 4mm. Head very light brown, height: 0.38mm, width: 0.42mm. Dorsal surface: green with dark green bands encircling thoracic segments and fold between abdominal segments one through nine. Anal area yellowish green. Lateral surface: green. Anal as dorsal. Ventral surface: yellow green. Anal as dorsal.

Syssaura puber Grote & Robinson

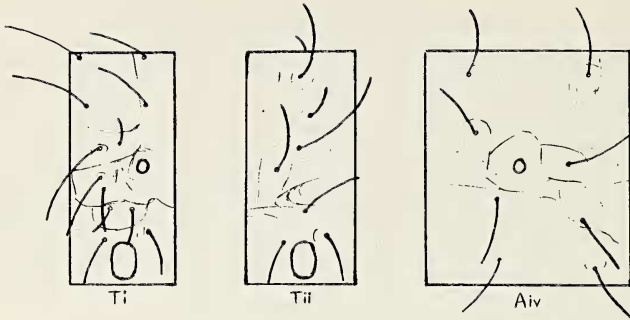
OVUM: Height: 0.74mm. Width: 0.58mm. Yellow changing to pale orange. Laid singly and in small groups on end or side. Eclosion in eight days.

FIRST INSTAR LARVAE: Length: approximately 3mm. Head very light yellow brown, height: 0.33mm, width: 0.36mm. Dorsal surface: thorax and last five abdominal segments yellow; first five abdominal segments light yellow. Dark brown square on first five abdominal segments. Lateral margins of squares joined by stripe running from first thoracic to eighth abdominal, paralleled by suprastigmatal brown stripes. Light brown band emerges from each square to encircle the body. Lateral surface: colors same as dorsal. First five abdominal stigma centered in a very dark brown irregular circle. A brown stripe joins each circle about the stigma. This stripe begins on first abdominal and ends on sixth abdominal. Ventral surface: colors same as dorsal. Dark brown square on the first five abdominal segments. A mid-ventral stripe joins the squares. Lateral margins of squares joined by stripes and paralleled by substigmatal stripes extending from first to sixth abdominal segments.

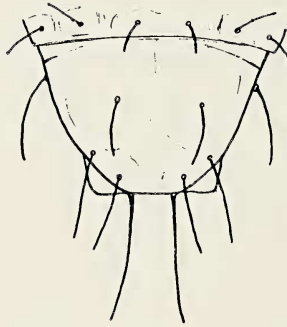
Apicia confusaria (Hubner)

OVUM: Height: 0.83mm. Width: 0.67mm. Green changing to dark golden brown. Laid loose without adhesive. Eclosion in ten days.

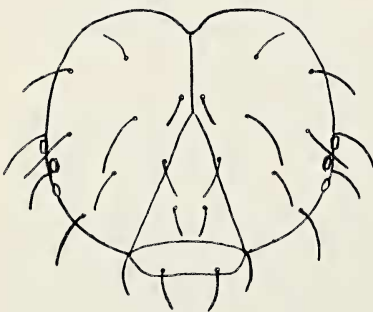
FIRST INSTAR LARVAE: Length: approximately 3mm. Head very dark brown almost black, height: 0.42mm, width: 0.38mm. Dorsal surface: first thoracic brown, second and third lighter with white blotches and markings. First six abdominal segments dark brown, last four lighter brown. First five abdominal segments with white V-shaped marking, base of V posteriorly oriented. White around base of setae of all abdominal segments. Lateral surface: thorax almost entirely white. Large white area



A



B

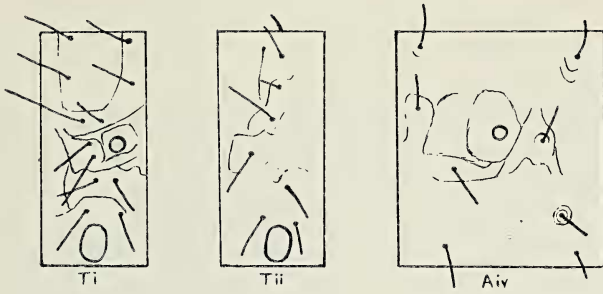


C

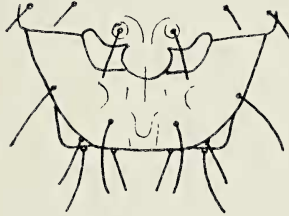


D

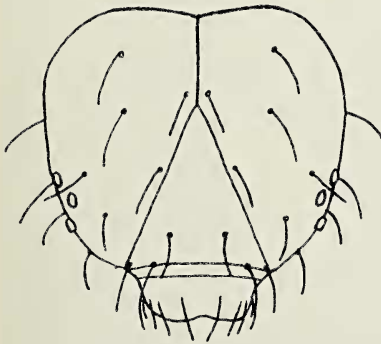
Fig. 2.—*Syssaura puber* Grote & Robinson; (A) setal maps; (B) anal plate; (C,D) head, frontal and left lateral aspect, 90X.



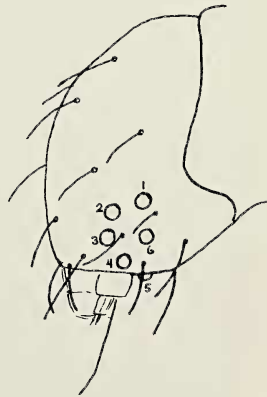
A



B



C



D

Fig. 3.—*Apicia confusaria* (Hubner); (A) setal maps; (B) anal plate; (C,D) head, frontal and left lateral aspect, 85X.

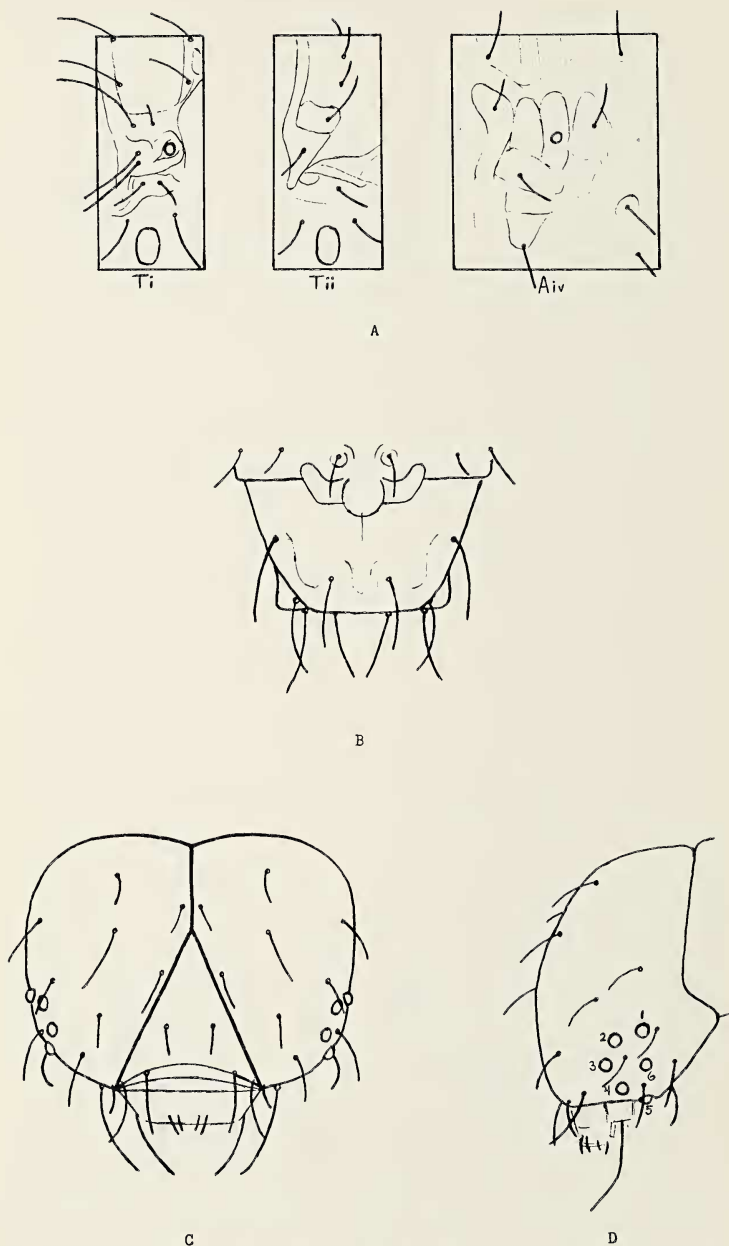


Fig. 4.—*Tetracis crocallata* Guenee; (A) setal maps; (B) anal plate; (C,D) head, frontal and left lateral aspect, 90X.

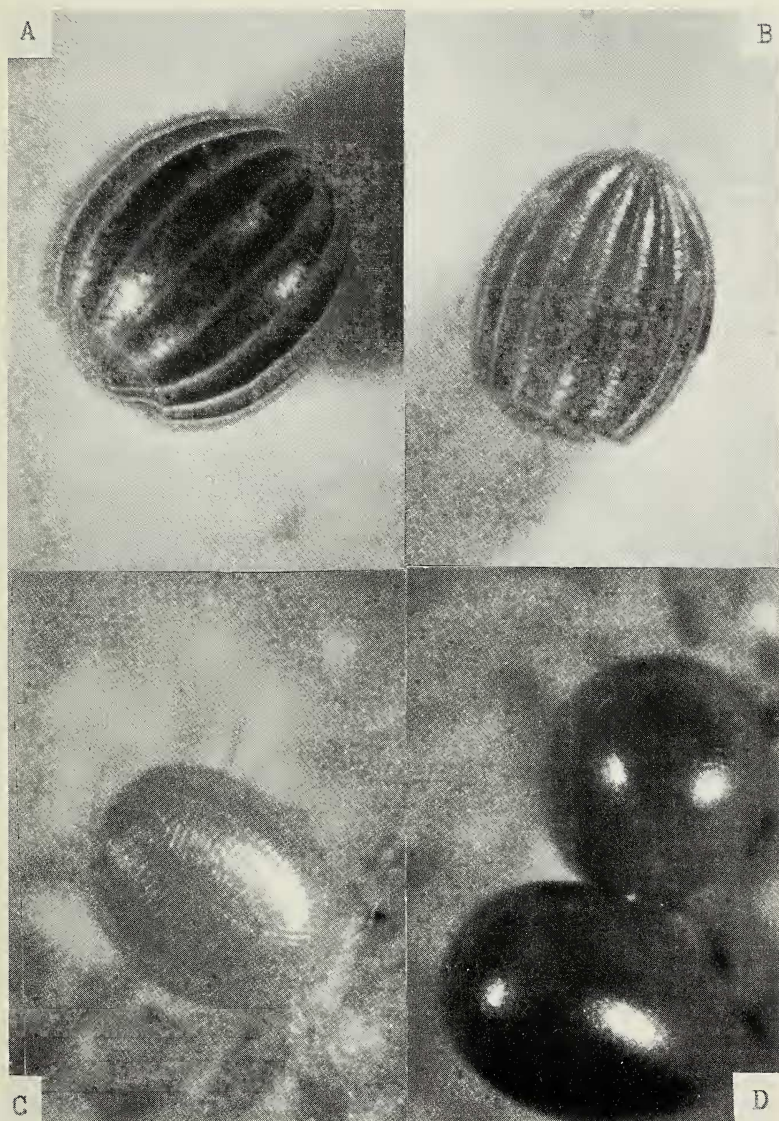


Fig. 5.—Ova; (A) *Tetracis crocallata*; (B) *Apicia confusaria*; (C) *Syssáura puber*; (D) *Pero marmoratus*, all 50X.

in center of each abdominal segment where setae are located. Abdominal colors same as dorsal. Ventral surface: thorax white and light brown. First five abdominal segments with white blotches and striations. Sixth abdominal segment with two white dashes. Abdominal colors same as dorsal.

Tetracis crocallata Guenee

OVUM: Height: 0.90mm. Width: 0.82mm. Very deep green. Laid loosely without adhesive. Ecllosion in eleven days.

FIRST INSTAR LARVAE: Length: approximately 3mm. Head very dark brown almost black, height: 0.36mm, width: 0.42mm. Dorsal surface: thorax dark brown, second and third segments with white blotches and markings. First six abdominal segments very dark brown almost black; last four segments brown. First five segments with white heart-shaped marking, bottom of heart posteriorly oriented. Last four segments have some vague creamy patterns. Lateral surface: thorax mostly white except for first segment which is mainly dark brown. Large white area in center of each abdominal segment where setae are located. Area is creamy yellow on last five segments. Abdominal colors same as dorsal. Ventral surface: thorax white and brown. First five abdominal segments with white blotches and striations. Abdominal colors same as dorsal.